A Study of Applying Self-learning Computer-assisted Instruction in a Physical Assessment Course for the Fourth-year Nursing Students in a Five-year Junior College in Southern Taiwan

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ABSTRACTS

The purpose of this study was to (a) design and apply self-learning computer-assisted instruction (SLCAI) in a physical assessment course (PA) to provide students with multi-media learning experiences, and (b) to investigate students' learning effectiveness (LE) of using SLCAI. SLCAI is consisted of multi-media PA teaching databases including course material, demonstration of PA practices as well as a variety of physical representations. A correlational design was to undertaken with a convenience sample of 981 fourth-year nursing students attending PA course. Students were asked to record their usage of SLCAI and satisfaction regarding the content in terms of clarity and accuracy as well as usefulness to increase learning interest and performance. Usage of SLCAI refers to the length of time spending on SLCAI; satisfaction was evaluated on a 5-point Likert scale (1: very dissatisfied, 5: very satisfied). LE was determined by mid-term and final written tests as well as PA validation examination.

The results of this study showed that (a) 93.2% of students used SLCAI for enhancing PA skills and reviewing course material; average of total time spending on SLCAI was 287 ± 314.6 minutes; the range of satisfaction was 4.08~4.27. (b) 6.8% of students did not use SLCAI due to inaccessibility of computer (64.3%) and no enough time (32.1%). (c) Students spending more than 211 minutes had significantly higher LE than students not used SLCAI ($F = 3.23$, $p < .05$). This study found SLCAI may enhance students' learning effectiveness. In the future, design PA course may involve integrating multi-media teaching material and interactive webpage to provide students with diverse learning resources and experiences.

Keyword：self-learning computer-assisted instruction、learning effectives

INTRODUCTION

Learning PA for nursing students is different from other nursing skills. Unless with prompt application and repeated practices of PA after each class, students may not proficiently exercise PA skills in the real world application.

This study was to design SLCAI integrating PA course materials. Instructors may implement it as a in-class teaching tool. Students may use it as a after-class self leaning tool based on their learning needs and speed. Further, this study was to explore students' usage of SLCAI, their satisfactions, and its impact on students' LE.

METHOD AND PROCEDURES

Establishments of SLCAI: Five instructors with several years of teaching PA experiences involved in designing SLCAI. The content of SLCAI was based on the textbook titled Physical Assessment: The Application in Nursing Care (Chiou, 2003). SLCAI was divided into four systems including cardiovascular, respiratory, abdomen, and nervous systems. In each system, anatomy, physiology, basic and distinctive PA skills with synchronizing audio effects were introduced. For example, real normal heart sounds and murmur were presented in cardiovascular system and breathing sounds in respiratory system. In addition, PA skill lively demonstration by instructors was included in each system. The diversity of SLCAI representation may increase students' learning motivation and provide students with different learning resources. Figure 1 is an example of the content of SLCAI.

Figure 1 An Example of the Content of SLCAI

Evaluation of LE: This study was undertaken from September 2003 through January 2004 with a convenience sample of 981 fourth-year nursing students in a five-year junior college in southern Taiwan. Figure 2 represents the procedures of this study. LE was determined by mid-term and final written tests as well as PA validation examination. Figure 3 shows students' usage of SLCAI after class.

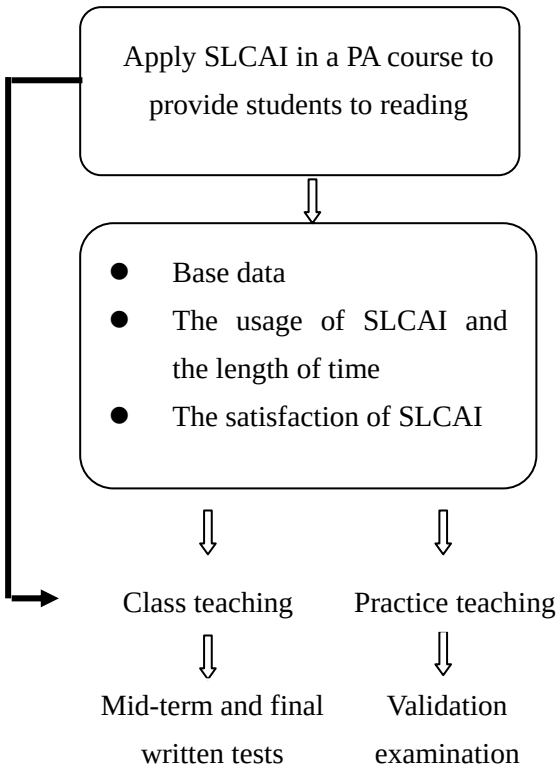

Figure 2 The Procedures of The Study

Figure 3 Students' Usage of SLCAI After Class

RESULTS and DISCUSSION

A total of 981 self-learning computer-assisted learning manuals were distributed and 851 were replied (86.7%).

1. Usage of SLCAI: Figure 4, 5, and 6 represent amount of students using SLCAI, reasons of using and not using SLCAI. Students indicated that SLCAI may help them with clarifying PA skill practices (88.3%), distinguishing normal and abnormal findings (for instance, heart sound and breathing sounds) (52.7%), and the content of the course (47.8%).

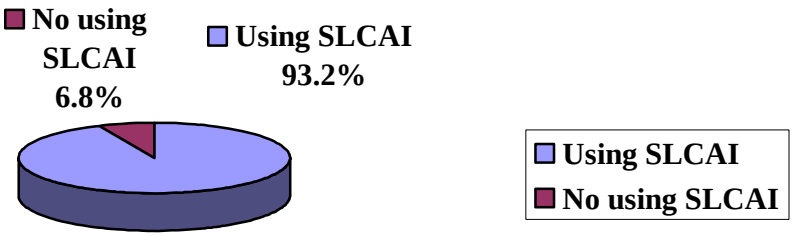

Figure 4. The Usage of SLCAI

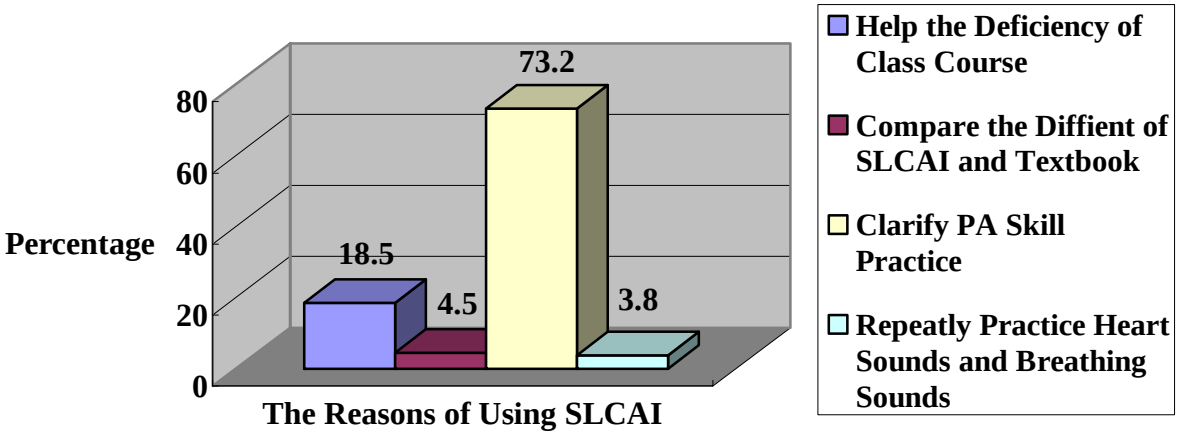

Figure 5. The Reasons of Using SLCAI

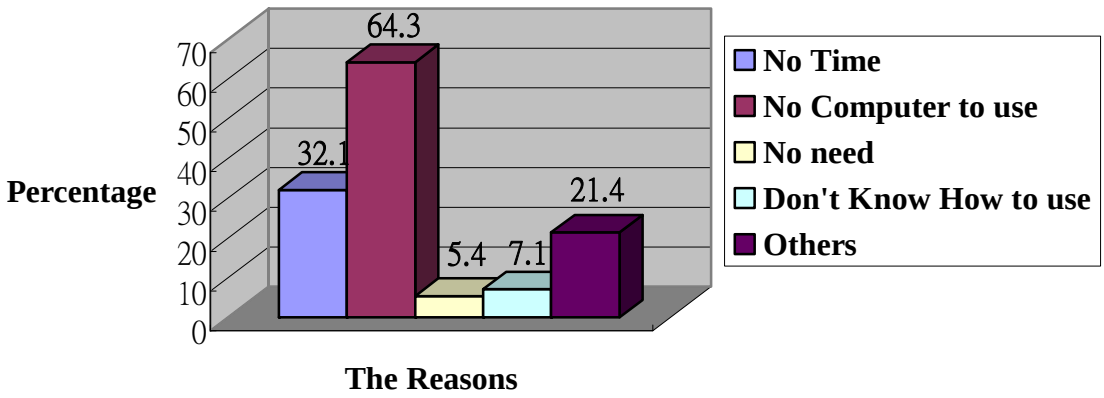

Figure 6. The Reasons of No Using SLCAI

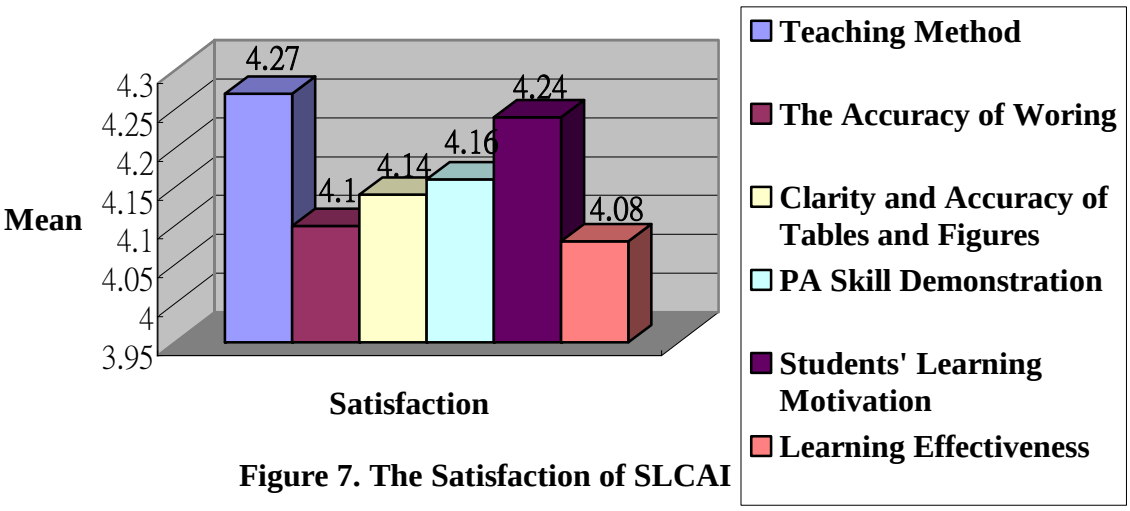

Figure 7. The Satisfaction of SLCAI

2. Satisfaction: Figure 7 shows SLCAI' teaching method, accuracy of wording, clarity and accuracy of tables and figures, PA skill demonstration, as well as students' learning motivation, and learning effectiveness. Satisfaction is measured on a 5-point Likert scale (1: very dissatisfied, 5: very satisfied).
3. Students' recommendations for SLCAI include (a) how to use SLCAI not clearly explained, (b) inaccessibility of computers, and (c) errors found in wordings, images and sound of PA skill demonstration.
4. Students' reports on SLCAI' strengths include (a) able to repeatedly review percussion sound, heart sound, heart murmur, and breathing sound and practice PA skills individually due to lively instructors' demonstration, as well as (b) increasing comprehension and clarifying misunderstanding due to coherence and accuracy of the content I SLCAI.

5. The range of using SLCAI time was 10-2200 minutes (M=287.0, SD=314.6). Figure 8 shows those spending more than 211 minutes on SLCAI had significantly higher LE ($F=3.23$, $p<.05$).

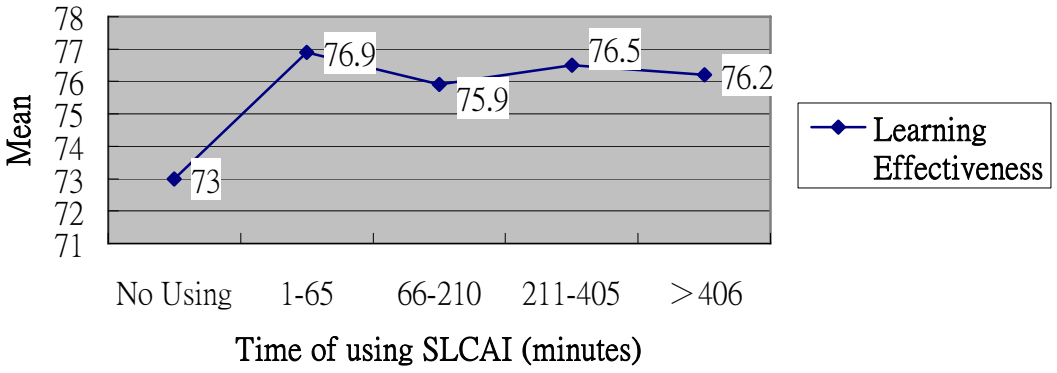

Figure 8. The relation of using SLCAI and Learning Effectiveness

CONCLUSION AND FUTURE STUDY

SLCAI was recommended for applying in PA course design in the future. Especially, instructors ay encourage students with lower learning effectiveness to use SLCAI. Students may record the usage SLCAI and bring out questions and recommendations to instructors, thus creating a mutual communication and learning experience.

REFERES

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Design and Learning Evaluation of Self-learning Computer-assisted Instruction: Applying in a Physical Assessment Course for Nursing Students

Physical assessment (PA) is a necessary acquisition for nurses. However, learning PA for nursing students is different from other nursing skills because of its complexity, breadth, and involvement of clinical decisions. Studies reported that self-learning computer-assisted instruction (SLCAI) is effective to bridge the gap between knowledge acquisition, skill development, and real-world application. The **objective** of this study was to investigate students' usage of SLCAI and their learning effectives (LE) in a PA course. A **descriptive and correlational study design** was undertaken with a convenience sample of 981 fourth-year nursing students attending PA course. **SLCAI** was implemented as a teaching tool by instructors for each class, but also as a learning tool by students after each class. Students were asked to record their usage of SLCAI and satisfaction on a 5-point Likert scale (1: very dissatisfied, 5: very satisfied). Students' **LE** was determined by mid-term and final written tests and validation examination. Based on 851 respondents, **results** showed (1) 767 (93.5%) used SLCAI for enhancing PA skill and clarifying misunderstandings; average of total time spending on SLCAI was 287±314.6 minutes; average of concentration time for each usage was 3.65±0.7 minutes; mean of satisfaction was 4.27±0.7; (2) among 56 (6.8%) not used SLCAI students, reasons included having no computers (64.3%) and no time (32.1%); and (3) students spending more than 211 minutes had significantly higher LE than students not used SLCAI ($F=3.23$, $p<0.05$). **Findings** of this study recommended effective use of SLCAI might enhance students' learning effectiveness.